

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : AISIN SEIKI CO LTD

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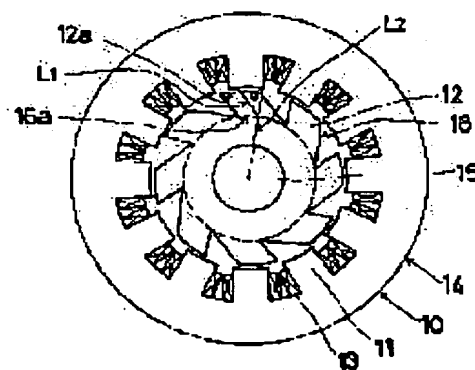
(72)Inventor : UMEMURA CHIAKI

(54) SWITCHED RELUCTANCE MOTOR

(57)Abstract:

PROBLEM TO BE SOLVED: To increase the rotational torque of a rotor by sliding a straight line, connecting the center of the rotor surface in which the rotor faces to the stator with the center of the rotor base, by a given angle to the straight line going outward in diametrical direction from the center of the facing part.

SOLUTION: A rotor pole 12 is arranged so that a straight line L1 connecting the center of the rotor surface in which the rotor faces to the stator with the center of the base part 16a of a rotor 16 may be deviated by an angle θ to the straight line L2 going outward in diametrical direction from the center of the facing part 12a. Hereby, in case that the direction of the circumferential component of this deviation and the rotational direction of the rotor 16 are the same, the rotational torque of the rotor 16 becomes large, and high torque can be obtained without increasing magnetic attraction.



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CLAIMS

[Claim(s)]

[Claim 1] The stator of the shape of a ring which has two or more stator poles which project toward the inside, the coil wound around said stator pole, and the inner circumference of said stator -- said stator -- receiving -- the same axle and relativity -- it being arranged pivotable and with Rota which has two or more Rota poles which can form said stator pole and magnetic circuit The straight line which connects the core of the confrontation section which is a ***** switched reluctance motor and meets said stator pole of said Rota pole, and the core of the fundus of said Rota The switched reluctance motor characterized by being shifted from the core of said confrontation section the degree of predetermined angle to the straight line which goes to the direction outside of a path.

[Claim 2] It is the switched RIRAKU lance motor characterized by having projected said stator pole toward the core of said Rota in the switched reluctance motor of claim 1.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates especially to the running torque of a motor about the switched reluctance motor used for the source of power of an electric vehicle etc.

[0002]

[Description of the Prior Art] Conventionally, it is known as a source of power of an electric vehicle that a switched reluctance motor will use. An example of the switched reluctance motor 40 (SR motor is called hereafter) known conventionally is shown in drawing 5. The SR motor 40 has been arranged pivotable centering on a revolving shaft 45 inside the stator 44 of the shape of a ring which has the stator pole 41 where it has been arranged in the shape of a periphery, and the coil 43 was rolled, and a stator 44, and is equipped with Rota 46 which has the Rota pole 42 which counters the stator pole 41. the SR motor 40 -- the stator pole 41 -- 12 poles and the Rota pole 42 -- 8 -- it has very much. If the stator pole 41 and the Rota pole 42 are projected in the direction of a path toward the core of Rota 46, respectively and a current flows in a coil 43, Rota 46 will rotate by the Rota pole 42 which the stator pole 41 generates the magnetic-attraction force, and has it in the nearest location being attracted on the stator pole 41.

[0003]

[Problem(s) to be Solved by the Invention] However, since the stator pole 41 and the Rota pole 42 are projected in the direction of a path toward the core of Rota by the above-mentioned conventional SR motor, respectively, the magnetic-attraction force committed to the hand of cut in Rota 46 to the magnetic-attraction force committed in the direction of a path is small. Therefore, running torque of Rota 46 could not be effectively obtained to the magnetic-attraction force generated from a coil 43, but when the number of turns of a coil were increased in order to enlarge running torque of Rota, or the current passed in a coil was enlarged, there was a problem that the direction component of a path of the magnetic-attraction force will also increase, and the noise will also increase.

[0004] Then, this invention makes it a technical technical problem to increase the running torque of Rota, without increasing the number of turns of a coil or enlarging the current passed in a coil.

[0005]

[Means for Solving the Problem] The stator of the shape of a ring which has two or more stator poles where claim 1 projects toward the inside in order to solve the above-mentioned technical problem, the coil wound around a stator pole, and the inner circumference of a stator -- a stator -- receiving -- the same axle and relativity -- it being arranged pivotable and with Rota which has a stator pole and two or more Rota poles which can form a magnetic circuit It was made for the straight line which connects the core of the confrontation section and the core of the fundus of Rota which meet the stator pole of the Rota pole to be shifted from the core of the confrontation section the degree of predetermined angle in the ***** switched reluctance motor to the straight line which goes to the direction outside of a path.

[0006] As opposed to the straight line in which the straight line which connects the core of the confrontation section of the Rota pole which meets a stator pole, and the core of the fundus of Rota according to claim 1 goes to the direction outside of a path from the core of the confrontation section the degree of predetermined angle by having made it shift When the component of the hoop direction of this gap and the hand of cut in Rota are the same directions, high torque can be acquired without the running torque of Rota becoming large and increasing the magnetic-attraction force compared with SR motor whose protrusion direction of the conventional Rota pole and a stator pole is the direction of a path.

[0007] Claim 2 had projected the stator pole toward the core of Rota in the switched reluctance motor of claim 1.

[0008] According to claim 2, a stator pole is made to project toward the core of Rota, i.e., it is having constituted, as only the Rota side's was shown in claim 1, a stator can increase the running torque of Rota further, it is the same configuration as the conventional SR motor, and can acquire high torque further, without increasing the magnetic-attraction force.

[0009]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. Drawing 1 is the sectional view of the SR motor 10 of the gestalt of 1 operation of this invention.

[0010] the stator 14 of the shape of a ring which has the stator pole 11 of 12 poles where the SR motor 10 of the gestalt of this operation projects toward the inside, the coil 13 with which it is wound around the stator pole 11, and the inner circumference of a stator 14 -- a core [revolving shaft / 15] -- a stator 14 -- receiving -- the same axle and relativity -- it is arranged pivotable and has Rota 16 which has the Rota pole 12 of the stator pole 11 and eight poles which can form a magnetic circuit. A stator 14 and Rota 16 carry out the laminating of the griddle, and constitute it.

[0011] The Rota pole 12 which is the meaning of this invention is explained. include-angle theta The Rota pole 12 has shifted to the straight line L2 in which the straight line L1 which connects the core of confrontation section 12a of the Rota pole 12 and the core of fundus 16a of Rota 16 which meet the stator pole 11 goes to the direction outside of a path from the core of confrontation section 12a. Moreover, the stator pole 11 is projected toward the core of Rota, that is, serves as the same configuration as the stator pole of the conventional SR motor shown in drawing 5 .

[0012] Although the sequence that a coil 13 generates the magnetic-attraction force can be set up and either an illustration clockwise rotation or a counterclockwise rotation can rotate Rota 16 by this by passing a current in order in each coil 13 with the current control unit which is not illustrated, in the gestalt of this operation, that the running torque of Rota 16 increases is the case where the illustration counterclockwise rotation theta, i.e., an include angle, is the hand of cut and the same direction of Rota 16.

[0013] In such a configuration, if a current flows in a coil 13, the magnetic-attraction force will occur between the Rota pole 12 in Rota 16, and the stator pole 11 of a stator 14. Here, in the part which the Rota pole 12 and the stator pole 11 overlapped in the hoop direction, the magnetic-attraction force works in the direction of a path, and the magnetic circuit which the Rota pole 12 and the stator pole 11 form does not affect rotation of Rota 16. However, in the part which the Rota pole 12 and the stator pole 11 do not overlap in a hoop direction, since the Rota pole 12 and the stator poles 11 tend to overlap mutually, the magnetic-attraction force works to a hoop direction, and thereby, Rota 16 rotates. That is, the running torque of Rota 16 becomes large, so that the magnetic-attraction force committed to a hoop direction is large.

[0014] Drawing 2 is drawing showing the running torque of Rota 16 when changing the straight line L2 which goes to the direction outside of a path, and the include angle theta to make from the core of confrontation section 12a of the Rota pole 12 in drawing 1 . By drawing 2 , when the component of the hoop direction of a gap and the hand of cut in Rota 16 by the include angle theta are the same direction that is, data in case the hand of cut in Rota 16 is the counterclockwise rotation of drawing 1 are shown. According to drawing 2 , in 0 to 45 degrees which is the analytical range of the include angle theta in the gestalt of this operation, it turns out that the running torque of Rota 16 becomes large, so that an include angle theta is enlarged.

[0015] Drawing in which drawing 3 shows the SR motor 20 of the gestalt of operation of the 2nd of this invention, and drawing 4 are drawings showing the SR motor 30 of the gestalt of operation of the 3rd of this invention. Since the gestalt of the 2nd and the 3rd operation is the same configuration as the SR motor 10 shown in drawing 1 except the configuration of the Rota pole by showing the case where the configuration of the Rota pole is changed, to the SR motor 10 of drawing 1 , explanation is omitted.

[0016] When the magnitude of the current which flows in a coil when the gap of a predetermined include angle to the straight line which goes to the direction outside of a path from the core of the confrontation section of the Rota pole is the direction where the hand of cut in Rota is the same according to the gestalt of this operation is the same, the protrusion direction of the conventional Rota pole and a stator pole can increase the running torque of Rota sharply compared with SR motor which is the direction of a path. Therefore, since running torque of Rota can be enlarged without increasing the number of turns of a coil or enlarging the current which flows in a coil, SR motor in which an output of high torque is possible can be offered.

[0017]

[Effect] As opposed to the straight line in which the straight line which connects the core of the

confrontation section of the Rota pole which meets a stator pole, and the core of the fundus of Rota according to claim 1 goes to the direction outside of a path from the core of the confrontation section the degree of predetermined angle by having made it shift When the component of the hoop direction of this gap and the hand of cut in Rota are the same directions, high torque can be acquired without the running torque of Rota becoming large and increasing the magnetic-attraction force compared with SR motor whose protrusion direction of the conventional Rota pole and a stator pole is the direction of a path.

[0018] According to claim 2, a stator pole is made to project toward the core of Rota, i.e., it is having constituted, as only the Rota side's was shown in claim 1, a stator can increase the running torque of Rota further, it is the same configuration as the conventional SR motor, and can acquire high torque further, without increasing the magnetic-attraction force.

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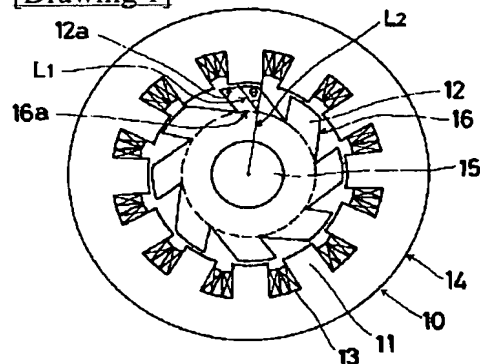
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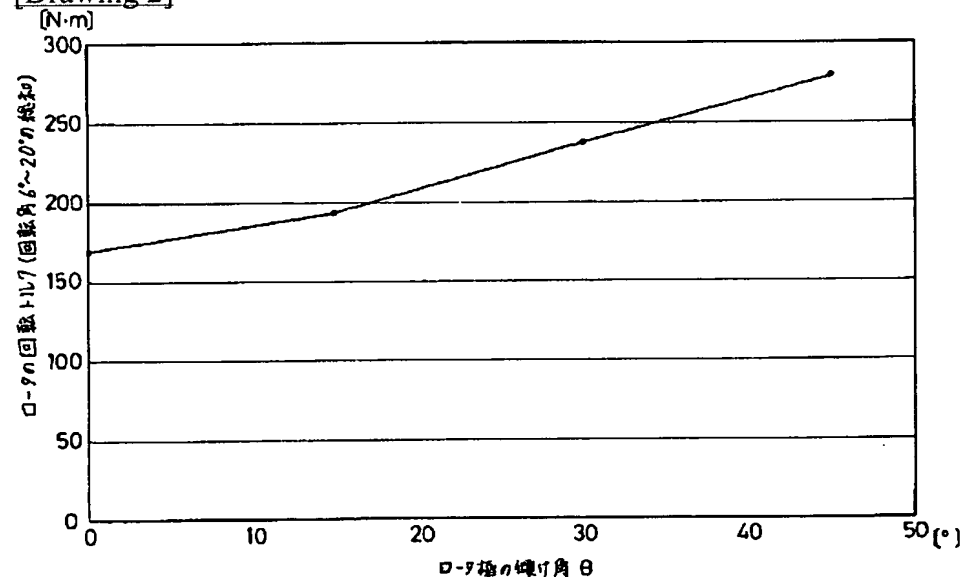
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DRAWINGS

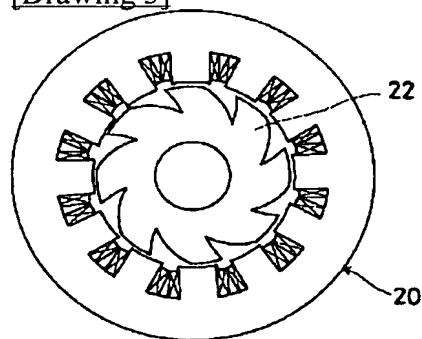
[Drawing 1]



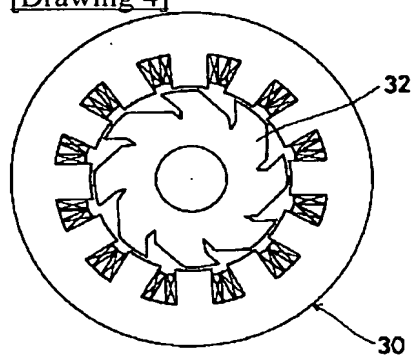
[Drawing 2]



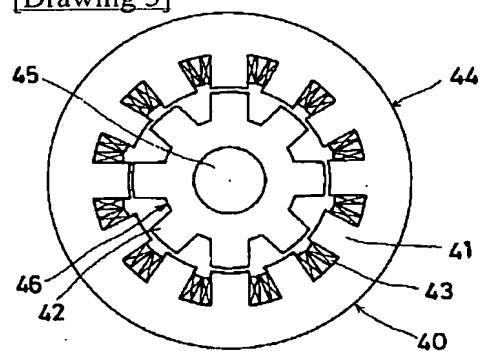
[Drawing 3]



[Drawing 4]



[Drawing 5]



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